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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/709,776	05/27/2004	William G. America	FIS920040083US1	3775

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HOFFMAN WARNICK LLC
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ALBANY, NY 12207

EXAMINER

IM, JUNGHWA M

ART UNIT	PAPER NUMBER
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2811

NOTIFICATION DATE	DELIVERY MODE
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12/01/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOCommunications@hoffmanwarnick.com

Office Action Summary	Application No. 10/709,776	Applicant(s) AMERICA, WILLIAM G.	
	Examiner JUNGHWA M. IM	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In view of the appeal brief filed on 1/10/2008, PROSECUTION IS HEREBY REOPENED. New grounds of rejections are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Lynne A. Gurley/

Supervisory Patent Examiner, Art Unit 2811

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 recites the limitation "the first sub-layer ... a group consisting of perfluoroalkylsiloxanes." This limitation is unclear since the instant invention does not disclose the first sub-layer is formed of 'perfluoroalkylsiloxanes'.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al (US Pat. 6,255,233), hereinafter Smith in view of Todd (US Pat. 6,733,830).

Regarding claim 21, insofar as understood, Fig. 3 of Smith shows a semiconductor device comprising:

a substrate [50;wafer substrate] including silicon;
a dielectric [150,160, 180, 190, 200] atop the substrate, the dielectric layer including a first dielectric sub-layer [200; SiOF] , a second dielectric sub-layer [180; SiN] and a first non-discrete transitional dielectric sub-layer [190; graded silicon oxynitride; col. 3, lines 51-57] residing between the first and second dielectric sub-layer layer, wherein the first dielectric sub-layer has an etch resistance different than the second

dielectric sub-layer, and an opening [185] extending no deeper than the sub-layer nearest the substrate; and

wherein a composition of the first non-discrete transitional dielectric sub-layer varies gradually through thickness thereof from a first composition substantially the same as the first dielectric sub-layer where the first non-discrete transitional dielectric sub-layer contacts the first dielectric sub-layer to a second composition substantially the same as the second dielectric sub-layer where the first non-discrete transitional dielectric sub-layer contacts the second dielectric sub-layer (Abstract).

Fig. 3 of Smith shows most aspects of the instant invention except the first sub-layer includes at least one component not included in the second sub-layer, the at least one component being selected from a group consisting of perfluoroalkylsiloxanes. Todd discloses the first dielectric sub-layer includes at least one component not included in the second sub-layer, that is, the first dielectric sub-layer being fluorinated through the at least one component being selected from a group consisting of perfluoroalkyl group, therefore, forming perfluoroalkylsiloxanes (col. 9, lines 14-56). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teachings Todd of into the device of Smith in order to have the first sub-layer including at least one component not included in the second sub-layer, the at least one component being selected from a group consisting of perfluoroalkylsiloxane to reduce the etch rate.

Regarding claim 22, Fig. 3 of Smith shows that an etch resistance of the first dielectric sub-layer [SiOF] is greater than an etch resistance of the second dielectric sub-layer [SiN].

Regarding claim 23, Fig. 3 of Smith shows that the first dielectric sub-layer [SiOF; fluorinated silicon oxide] has a greater content of fluorine than the second dielectric sub-layer [SiN].

Regarding claim 24, Todd discloses the first dielectric sub-layer includes at least one component not included in the second sub-layer, that is, the first dielectric sub-layer being fluorinated through the at least one component being selected from a group consisting of methylsilane, dimethylsilane, trimethylsilane, trifluoromethylsilane, 1,2-disilano tetrafluoroethylene, 1,3-bis(silano difluoromethylene)disiloxane, 2,2-disilano hexafluorosilane, bis(trifluoromethyl disiloxanyl)difluoromethane, octamethylcyclotetrasiloxane, and tetramethylcyclotetrasiloxane (col. 7, lines 48-55).

Regarding claim 25, Fig. 3 of Smith shows that the dielectric layer includes a third dielectric sub-layer [150; SiN] residing between the substrate and the first dielectric sub-layer and a second non-discrete transitional dielectric sub-layer [160; graded silicon oxynitride; col. 3, lines 51-57] residing between the third dielectric sub-layer and the first dielectric sub-layer.

Regarding claim 26, Fig. 3 of Smith shows that the second dielectric sub-layer [180; SiN] and the third dielectric sub-layer [150; SiN] have substantially the same etch resistance.

Response to Arguments

Applicant's arguments filed 8/29/2008 have been fully considered but they are not persuasive.

Applicant argues that "Thus, Todd relies on the use of various precursors, including siloxanes (col. 9, line. 13), (fluoroalkyl)fluorosiloxanes (id., line 26), and (fluoroalkyl)silanes (id., line 41), to facilitate the formation of a low-k film, or a resulting film with one or more desirable properties (id., line 10-12). Appellant submits that Todd does not, however, teach or suggest using or forming a perfluoroalkyl group, or specifically, perfluoroalkylsiloxanes." This is not persuasive. Note that the instant invention does not disclose that the dielectric layer of perfluoroalkylsiloxanes is formed by adding the perfluoroalkylsiloxanes material. Rather, the instant invention discloses that the fluoro-substituted dielectric layer is formed through treating the dielectric layer with the fluorocarbon. And Todd discloses the substantially identical procedure to the instant invention. (See col. 9, lines 14-56). That is, Todd discloses that (fluoroalkyl)fluorosiloxanes are used where of the formula $[(R_f)_{3-x-y}R^1_xF_y]Si_2O$ where R_f is a perfluoromethyl, perfluoroethyl or perfluoropropyl group.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUNGHWA M. IM whose telephone number is (571)272-1655. The examiner can normally be reached on MON.-FRI. 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Junghwa M. Im/
Examiner, Art Unit 281

/J. M. I./
Examiner, Art Unit 2811

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